

### AMENDMENTS TO THE CLAIMS

1. (Currently amended) A ~~sensor head for use in an~~ wholly implantable analyte measuring device comprising:

a) a non-conductive body configured for subcutaneous implantation in a host;

b) a working electrode, a reference electrode and a counter electrode, wherein said electrodes pass through said non-conductive body forming an electrochemically reactive surface at one location on said body and an electronic connection at another location on said body, further wherein said electrochemical reactive surface of said counter electrode is greater than the surface area of said working electrode, whereby oxygen availability to the counter electrode is increased; and

c) a multi-region membrane affixed over said non-conductive body and covering said working electrode, reference electrode and counter electrode, wherein the multi-region membrane comprises a cell disruptive domain that supports tissue ingrowth.

2. (Currently amended) A ~~sensor head for use in an implantable~~ wholly implantable analyte measuring device comprising:

a) a non-conductive body suitable configured for implantation in a host;

b) a working electrode, a reference electrode and a counter electrode, wherein said electrodes pass through said non-conductive body forming an electrochemically reactive surface at one location on said body and an electronic connection at another location on said body, further wherein said electrochemical reactive surface of said counter electrode is greater than the surface area of said working electrode, whereby oxygen availability to the counter electrode is increased; and

c) a multi-region membrane affixed over said non-conductive body and covering said working electrode, reference electrode and counter electrode, wherein the multi-region membrane comprises an enzyme domain configured for long-term use.

3. (Currently amended) A sensor head wholly implantable analyte measuring device according to claim 1 wherein said multi-region membrane comprises an oxygen antenna domain.

4. (Currently amended) A sensor head wholly implantable analyte measuring device according to claim 2 wherein said multi-region membrane comprises an oxygen antenna domain.

5. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 2 wherein said multi-region membrane comprises a first region distant from said electrochemically reactive surfaces, a second region less distant from said electrochemically reactive surfaces and a third region adjacent to said electrochemically reactive surfaces.

6. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 5 wherein said first region comprises a the cell disruptive domain distant from said electrochemically reactive surfaces and a cell impermeable domain less distant from said electrochemically reactive surfaces.

7. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 5 wherein said second region is a glucose exclusion domain.

8. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 5 wherein said third region comprises an immobilized enzyme domain distant from said electrochemically reactive surfaces, an interference domain less distant from said electrochemically reactive surfaces than said immobilized enzyme domain and a hydrogel domain adjacent to said electrochemically reactive surfaces.

9. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 8 wherein said third region further comprises a resistance domain more distant from said electrochemically reactive surfaces than said immobilized enzyme domain.

10. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 5 wherein said first region is permeable to oxygen and glucose.

11. (Canceled)

12. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 2 wherein said multi-region membrane comprises a first region distant from said electrochemically reactive surfaces and a further region adjacent to said electrochemically reactive surfaces.

13. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 12 wherein said first region comprises a cell disruptive domain distant from said electrochemically reactive surfaces and a cell impermeable domain less distant from said electrochemically reactive surfaces.

14. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 12 wherein said further region comprises ~~an-immobilized~~ the enzyme domain distant from said electrochemically reactive surfaces, an interference domain less distant from said electrochemically reactive surfaces than said immobilized enzyme domain and a hydrogel domain adjacent to said electrochemically reactive surfaces.

15. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 14 wherein said further region further comprises a resistance domain more distant from said electrochemically reactive surfaces than said immobilized enzyme domain.

16-20. (Canceled)

21. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 2 wherein said non-conductive body is made of ceramic or glass.

22. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 2 wherein said non-conductive body is made of plastic or polymer.

23. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 2 wherein said working electrode is made of platinum.

24. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 2 wherein said counter electrode is made of platinum or gold.

25. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 2 wherein said electrochemically reactive surface of said counter electrode is greater than or equal to about two times the surface area of the working electrode and is less than or equal to about 100 times the surface area of the working electrode.

26. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 2 wherein said electrode is greater than or equal to about two times the surface area of the working electrode and is less than or equal to about 50 times the surface area of the working electrode.

27. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 2 wherein said electrochemically reactive surface of said counter electrode is greater than or equal to about two times the surface area of the working electrode and is less than or equal to about 25 times the surface area of the working electrode.

28. (Currently amended) A ~~sensor-head~~ wholly implantable analyte measuring device according to claim 2 wherein said electrochemically reactive surface of said counter electrode is greater than or equal to about two times the surface area of the working electrode and is less than or equal to about 10 times the surface area of the working electrode.

29. (Canceled)

30. (Currently amended) A method of monitoring glucose levels, comprising:

a) providing i) a host, and ii) ~~an~~ a wholly implantable analyte measuring device according to claim 29 1; and

b) implanting said device in said host.

31. (Original) A method according to claim 30 wherein said implanting is subcutaneous.

32. (Currently amended) A method of measuring glucose in a biological fluid, comprising;

a) providing i) a host, and ii) ~~an~~ a wholly implantable analyte measuring device according to claim 29 1, said ~~sensor-head~~ wholly implantable analyte measuring device being capable of accurate continuous glucose sensing; and  
implanting said device in said host.

33. (Original) A method according to claim 32, wherein said implanting is subcutaneous.